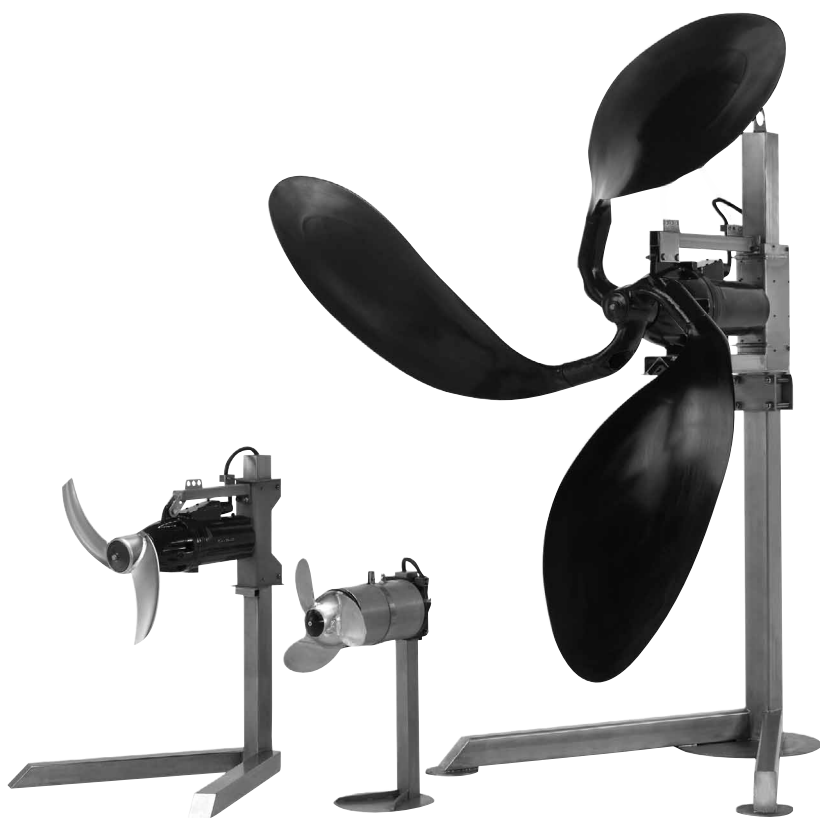


AMD, AMG, AFG Mixers and flowmakers

Installation and operating instructions



Declaration of conformity

Declaration of Conformity

GB Declaration of Conformity

We, Grundfos, declare under our sole responsibility that the products AMD, AMG and AFG, to which this declaration relates, are in conformity with these Council directives on the approximation of the laws of the EC member states:

- Machinery (2006/42/EC).
Standard used: EN ISO 12100: 2003.
- Low Voltage Directive (2006/95/EC).
Standards used: EN 60034 and EN 60204: 2006.
- EMC Directive (2004/108/EC).
Standards used: EN 61000-6-2: 2005 and EN 61000-6-3: 2007.
- ATEX Directive (94/9/EC) (AMD, AMG, AFG, relay ALR-20/A Ex).
Applies only to products intended for use in potentially explosive environments, II 2G, equipped with the separate ATEX approval plate and EC-type examination certificate.
Further information, see below.

CZ Prohlášení o shodě

My firma Grundfos prohlašujeme na svou plnou odpovědnost, že výrobky AMD, AMG a AFG, na něž se toto prohlášení vztahuje, jsou v souladu s ustanoveními směrnice Rady pro sblížení právních předpisů členských států Evropského společenství v oblasti:

- Směrnice pro strojní zařízení (2006/42/ES).
Použitá norma: EN ISO 12100: 2003.
- Směrnice pro nízkonapětové aplikace (2006/95/ES).
Použitá norma: EN 60034 a EN 60204: 2006.
- Směrnice pro elektromagnetickou kompatibilitu (EMC) (2004/108/ES).
Použitá norma: EN 61000-6-2: 2005 a EN 61000-6-3: 2007.
- Směrnice pro ATEX (94/9/ES) (AMD, AMG, AFG, relé ALR-20/A Ex).

Platí pouze pro výrobky určené pro použití v potenciálně výbušném prostředí, II 2G, opatřené samostatným typovým štítkem s označením ATEX a certifikátem o zkoušce typu ES.
Další informace jsou uvedeny níže.

DE Konformitätserklärung

Wir, Grundfos, erklären in alleiniger Verantwortung, dass die Produkte AMD, AMG und AFG, auf die sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EU-Mitgliedsstaaten übereinstimmen:

- Maschinenrichtlinie (2006/42/EG).
Norm, die verwendet wurde: EN ISO 12100: 2003.
- Niederspannungsrichtlinie (2006/95/EG).
Normen, die verwendet wurden: EN 60034 und EN 60204: 2006.
- EMV-Richtlinie (2004/108/EG).
Normen, die verwendet wurden: EN 61000-6-2: 2005 und EN 61000-6-3: 2007.
- ATEX-Richtlinie (94/9/EG) (AMD, AMG, AFG, Relais ALR-20/A Ex).
Gilt nur für Produkte, die für den Gebrauch in potentiell explosiver Umgebung nach II 2G bestimmt und mit einem separaten ATEX-Typenschild und einem EG-Prüfzeugnis ausgestattet sind.
Weitere Informationen, siehe unten.

BG Декларация за съответствие

Ние, фирма Grundfos, заявяваме с пълна отговорност, че продуктите AMD, AMG и AFG, за които се отнася настоящата декларация, отговарят на следните указания на Съвета за уеднаквяване на правните разпоредби на държавите членки на ЕС:

- Директива за машините (2006/42/EC).
Приложен стандарт: EN ISO 12100: 2003.
- Директива за нисковолтови системи (2006/95/EC).
Приложени стандарти: EN 60034 и EN 60204: 2006.
- Директива за електромагнитна съвместимост (2004/108/EC).
Приложени стандарти: EN 61000-6-2: 2005 и EN 61000-6-3: 2007.
- АТЕХ директива (94/9/EC) (AMD, AMG, AFG, реле ALR-20/A Ex).
Приложими само за продукти, предназначени за използване в потенциално взривоопасни среди, клас II 2G, доставени с АТЕХ сертификат и ЕО Сертификат за изпитание.
Сертификат за изпитание.

DK Overensstemmelseserklæring

Vi, Grundfos, erklærer under ansvar at produkterne AMD, AMG og AFG som denne erklæring omhandler, er i overensstemmelse med disse af Rådet direktiver om indbyrdes tilnærmelse til EF-medlemsstaternes lovgivning:

- Maskindirektivet (2006/42/EF).
Anvendt standard: EN ISO 12100: 2003.
- Lavspændingsdirektivet (2006/95/EF).
Anvendte standarder: EN 60034 og EN 60204: 2006.
- EMC-direktivet (2004/108/EF).
Anvendte standarder: EN 61000-6-2: 2005 og EN 61000-6-3: 2007.
- ATEX-direktivet (94/9/EF) (AMD, AMG, AFG, relæ ALR-20/A Ex).
Gælder kun produkter til eksplosionsfarlige omgivelser, II 2G, med et separat ATEX-godkendelsestikil og EF-typeprøvningscertifikat.
Yderligere oplysninger, se nedenfor.

EE Vastavuse deklaratsioon

Meie, Grundfos, deklareerime enda ainuvastutuse, et tooted AMD, AMG ja AFG, mille kohta käesolev juhend käib, on vastavuses EÜ Nõukogu direktiividega EMÜ liikmesriikide seaduste ühitamise kohta, mis käsitlevad:

- Masinate ohutus (2006/42/EC).
Kasutatud standard: EN ISO 12100: 2003.
- Madalpinge direktiiv (2006/95/EC).
Kasutatud standardid: EN 60034 ja EN 60204: 2006.
- Elektromagnetilise ühilduvuse (EMC direktiiv) (2004/108/EC).
Kasutatud standardid: EN 61000-6-2: 2005 ja EN 61000-6-3: 2007.
- ATEX direktiiv (94/9/EC) (AMD, AMG, AFG, rele ALR-20/A Ex).
Kehtib ainult toodetele, mis on mõeldud kasutamiseks potentsiaalselt plahvatusohtlikus keskkonnas, II 2G, varustatud eraldi ATEX tunnustuse andmesildiga ja EC-tüüpi kontrollsertifikaadiga. Täiendav info, vaata alla.

Product	Certificate No	Standards used
AMD, AMG, AFG	SEV 05 ATEX 0109 X SEV 05 ATEX 0111 X	EN 1127-1: 2007, EN 60079-0: 2009, EN 60079-1: 2007, EN 60079-7: 2007, EN 60079-11: 2007, EN 13463-1: 2009, EN 13463-5: 2003 and EN 13463-8: 2003.
ALR-20/A Ex	SEV 05 ATEX 0131	EN 1127-1: 2007, EN 60079-0: 2006 and EN 60079-11: 2007.

Notified body: Electrosuisse. No. 1258. Luppmenstrasse 1, CH-8320 Fehraltorf, Switzerland.
Manufacturer: GRUNDFOS Arnold AG, Industrie Nord 12, CH-6105 Schachen, Switzerland.

GR Δήλωση Συμμόρφωσης

Εμείς, η Grundfos, δηλώνουμε με αποκλειστικά δική μας ευθύνη ότι τα προϊόντα AMD, AMG και AFG στα οποία αναφέρεται η παρούσα δήλωση, συμμορφώνονται με τις εξής Οδηγίες του Συμβουλίου περί προσάγγισης των νομοθεσιών των κρατών μελών της ΕΕ:

- Οδηγία για μηχανήματα (2006/42/CE).
Πρότυπο που χρησιμοποιήθηκε: EN ISO 12100: 2003.
- Οδηγία χαμηλής τάσης (2006/95/CE).
Πρότυπα που χρησιμοποιήθηκαν: EN 60034 και EN 60204: 2006.
- Οδηγία Ηλεκτρομαγνητικής Συμβατότητας (EMC) (2004/108/EC).
Πρότυπα που χρησιμοποιήθηκαν: EN 61000-6-2: 2005 και EN 61000-6-3: 2007.
- Οδηγία ATEX (94/9/CE) (AMD, AMG, AFG, Ρελέ ALR-20/A Ex).
Ισχύει μόνο για προϊόντα που απευθύνονται για χρήση σε δυνητικά εκρηκτικά περιβάλλοντα, II 2G, εφοδιασμένα με τη χωριστή πινακίδα έγκρισης ATEX και πιστοποιητικό εξέτασης τύπου CE.
Για περισσότερες πληροφορίες, βλέπε κατωτέρω.

FR Déclaration de Conformité

Nous, Grundfos, déclarons sous notre seule responsabilité, que les produits AMD, AMG et AFG, auxquels se réfère cette déclaration, sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives aux normes énoncées ci-dessous :

- Directive Machines (2006/42/CE).
Norme utilisée : EN ISO 12100: 2003.
- Directive Basse Tension (2006/95/CE).
Normes utilisées : EN 60034 et EN 60204: 2006.
- Directive Compatibilité Electromagnétique CEM (2004/108/CE).
Normes utilisées : EN 61000-6-2: 2005 et EN 61000-6-3: 2007.
- Directive ATEX (94/9/CE) (AMD, AMG, AFG, relais ALR-20/A Ex).
S'applique uniquement aux produits utilisés dans des environnements potentiellement explosifs, II 2G, équipés d'une plaque séparée avec norme ATEX et d'un certificat d'examination type CE. Pour plus d'informations, voir ci-après.

IT Dichiarazione di Conformità

Grundfos dichiara sotto la sua esclusiva responsabilità che i prodotti AMD, AMG e AFG, ai quali si riferisce questa dichiarazione, sono conformi alle seguenti direttive del Consiglio riguardanti il riavvicinamento delle legislazioni degli Stati membri CE:

- Direttiva Macchine (2006/42/CE).
Norma applicata: EN ISO 12100: 2003.
- Direttiva Bassa Tensione (2006/95/CE).
Norme applicate: EN 60034 e EN 60204: 2006.
- Direttiva EMC (2004/108/CE).
Norme applicate: EN 61000-6-2: 2005 e EN 61000-6-3: 2007.
- Direttiva ATEX (94/9/CE) (AMD, AMG, AFG, relè ALR-20/A Ex).
Si riferisce solo ai prodotti per uso in ambienti potenzialmente esplosivi EX II 2G, con targa di approvazione ATEX a parte e certificato tipo CE. Per ulteriori informazioni, vedere oltre.

ES Declaración de Conformidad

Nosotros, Grundfos, declaramos bajo nuestra entera responsabilidad que los productos AMD, AMG y AFG, a los cuales se refiere esta declaración, están conformes con las Directivas del Consejo en la aproximación de las leyes de los Estados Miembros del EM:

- Directiva de Maquinaria (2006/42/CE).
Norma aplicada: EN ISO 12100: 2003.
- Directiva de Baja Tensión (2006/95/CE).
Normas aplicadas: EN 60034 y EN 60204: 2006.
- Directiva EMC (2004/108/CE).
Normas aplicadas: EN 61000-6-2: 2005 y EN 61000-6-3: 2007.
- Directiva ATEX (94/9/CE) (AMD, AMG, AFG, relé ALR-20/A Ex).
Se aplica sólo a productos concebidos para su utilización en entornos potencialmente explosivos, II 2G, equipados con una placa independiente de homologación ATEX y certificado de prueba tipo CE. Para información adicional, ver más abajo.

HR Izjava o usklađenosti

Mi, Grundfos, izjavljujemo pod vlastitom odgovornošću da je proizvod AMD, AMG i AFG, na koji se ova izjava odnosi, u skladu s direktivama ovog Vijeća o usklađivanju zakona država članica EU:

- Direktiva za strojeve (2006/42/EZ).
Korištena norma: EN ISO 12100: 2003.
- Direktiva za niski napon (2006/95/EZ).
Korištena norma: EN 60034 i EN 60204: 2006.
- Direktiva za elektromagnetsku kompatibilnost (2004/108/EZ).
Korištena norma: EN 61000-6-2: 2005 i EN 61000-6-3: 2007.
- ATEX uredba (94/9/EZ) (AMD, AMG, AFG, relej ALR-20/A Ex).
Odnosi se samo na proizvode namijenjene uporabi u potencijalno eksplozivnom okruženju, II 2G, opremljene s dodatnom ATEX pločicom i certifikatom EZ o ispitivanju.
Više informacija potražite niže u tekstu.

LV Paziņojums par atbilstību prasībām

Sabiedrība GRUNDFOS ar pilnu atbildību dara zināmu, ka produkti AMD, AMG un AFG, uz kuriem attiecas šis paziņojums, atbilst šādām Padomes direktīvām par tuvināšanos EK dalībvalstu likumdošanas normām:

- Mašīnbūves direktīva (2006/42/EK).
Piemērotais standarts: EN ISO 12100: 2003.
- Zema sprieguma direktīva (2006/95/EK).
Piemērotie standarti: EN 60034 un EN 60204: 2006.
- Elektromagnētiskās sadarbības direktīva (2004/108/EK).
Piemērotie standarti: EN 61000-6-2: 2005 un EN 61000-6-3: 2007.
- ATEX direktīva (94/9/EK) (AMD, AMG, AFG, relejs ALR-20/A Ex).
Attiecas tikai uz tādiem izstrādājumiem, kas ir paredzēti lietošanai potenciāli sprādzienbīstamās vidēs, II 2G, ir aprīkoti ar atsevišķu ATEX apstiprinājuma plāksnīti un EK pārbaudes sertifikātu.
Papildus informāciju skatīt zemāk.

Product	Certificate No	Standards used
AMD, AMG, AFG	SEV 05 ATEX 0109 X SEV 05 ATEX 0111 X	EN 1127-1: 2007, EN 60079-0: 2009, EN 60079-1: 2007, EN 60079-7: 2007, EN 60079-11: 2007, EN 13463-1: 2009, EN 13463-5: 2003 and EN 13463-8: 2003.
ALR-20/A Ex	SEV 05 ATEX 0131	EN 1127-1: 2007, EN 60079-0: 2006 and EN 60079-11: 2007.

Notified body: Electrosuisse. No. 1258. Luppmenstrasse 1, CH-8320 Fehraltorf, Switzerland.

Manufacturer: GRUNDFOS Arnold AG, Industrie Nord 12, CH-6105 Schachen, Switzerland.

LT Atitikties deklaracija

Mes, Grundfos, su visa atsakomybe pareiškiame, kad gaminiai AMD, AMG ir AFG, kuriems skirta ši deklaracija, atitinka šias Tarybos Direktyvas dėl Europos Ekonominės Bendrijos šalių narių įstatymų suderinimo:

- Mašinų direktyva (2006/42/EB).
Taikomas standartas: EN ISO 12100: 2003.
- Žemų įtampų direktyva (2006/95/EB).
Taikomi standartai: EN 60034 ir EN 60204: 2006.
- EMS direktyva (2004/108/EB).
Taikomi standartai: EN 61000-6-2: 2005 ir EN 61000-6-3: 2007.
- ATEX direktyva (94/9/EB) (AMD, AMG, AFG, relė ALR-20/A Ex).
Galiauja tik produktams, skirtiems naudoti potencialiai sprogioje aplinkoje, II 2G, ir turintiems atskirą ATEX atitikties lentelę ir EB tipo patikrinimo sertifikatą. Daugiau informacijos pateikiama žemiau.

NL Overeenkomstigheidsverklaring

Wij, Grundfos, verklaren geheel onder eigen verantwoordelijkheid dat de producten AMD, AMG en AFG waarop deze verklaring betrekking heeft, in overeenstemming zijn met de Richtlijnen van de Raad in zake de onderlinge aanpassing van de wetgeving van de EG Lidstaten betreffende:

- Machine Richtlijn (2006/42/EC).
Gebruikte norm: EN ISO 12100: 2003.
- Laagspannings Richtlijn (2006/95/EC).
Gebruikte normen: EN 60034 en EN 60204: 2006.
- EMC Richtlijn (2004/108/EC).
Gebruikte normen: EN 61000-6-2: 2005 en EN 61000-6-3: 2007.
- ATEX Richtlijn (94/9/EC) (AMD, AMG, AFG, relais ALR-20/A Ex).
Is alleen van toepassing op pompen welke gebruikt worden in een explosie gevaarlijke omgeving, II 2G, met een afzonderlijke ATEX-goedkeuring plaats en EG-type onderzoekscertificaat.
- Voor verdere informatie, zie onderstaand.

PL Deklaracja zgodności

My, Grundfos, oświadczamy z pełną odpowiedzialnością, że nasze wyroby AMD, AMG oraz AFG, których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady d/s ujednolicenia przepisów prawnych krajów członkowskich WE:

- Dyrektywa Maszynowa (2006/42/WE).
Zastosowana norma: EN ISO 12100: 2003.
- Dyrektywa Niskonapięciowa (LVD) (2006/95/WE).
Zastosowane normy: EN 60034 oraz EN 60204: 2006.
- Dyrektywa EMC (2004/108/WE).
Zastosowane normy: EN 61000-6-2: 2005 oraz EN 61000-6-3: 2007.
- Dyrektywa ATEX (94/9/WE)
(AMD, AMG, AFG, przekaźnik ALR-20/A Ex).
Dotyczy tylko produktów przeznaczonych do pracy w środowisku potencjalnie zagrożonym wybuchem, II 2G, wyposażonych w oddzielną tabliczkę znamionową ATEX i certyfikat typu EG (examination certificate).
Więcej informacji na ten temat, patrz poniżej.

HU Konformitási nyilatkozat

Mi, a Grundfos, egyedüli felelősséggel kijelentjük, hogy a AMD, AMG és AFG termékek, amelyekre jelen nyilatkozik vonatkozik, megfelelnek az Európai Unió tagállamainak jogi irányelveit összehangoló tanács alábbi előírásainak:

- Gépek (2006/42/EK).
Alkalmazott szabvány: EN ISO 12100: 2003.
- Kisfeszültségű Direktíva (2006/95/EK).
Alkalmazott szabványok: EN 60034 és EN 60204: 2006.
- EMC Direktíva (2004/108/EK).
Alkalmazott szabványok: EN 61000-6-2: 2005 és EN 61000-6-3: 2007.
- ATEX Direktíva (94/9/EK) (AMD, AMG, AFG, relé ALR-20/A Ex).
Azon szivattyú típusokra vonatkozik, melyek potenciónálisan robbanásveszélyes környezetben telepíthetők, II 2G, és el vannak látva egy további ATEX jelzésű adattáblával, valamint rendelkeznek EK típusú vizsgálati bizonylattal is. További információkat lásd alul.

UA Свідчення про відповідність вимогам

Компанія Grundfos заявляє про свою виключну відповідальність за те, що продукти AMD, AMG та AFG, на які поширюється дана декларація, відповідають таким рекомендаціям Ради з уніфікації правових норм країн - членів ЄС:

- Механічні прилади (2006/42/ЄС).
Стандарти, що застосовувалися: EN ISO 12100: 2003.
- Низька напруга (2006/95/ЄС).
Стандарти, що застосовувалися: EN 60034 та EN 60204: 2006.
- Електромагнітна сумісність (2004/108/ЄС).
Стандарти, що застосовувалися: EN 61000-6-2: 2005 та EN 61000-6-3: 2007.
- АТЕХ Директива (94/9/ЄС) (AMD, AMG, AFG, реле ALR-20/A Ex).
Застосовується тільки для обладнання, що встановлюється в потенційно вибухонебезпечних зонах, II 2G, і зонах, оснащених плитою-основою, схваленою АТЕХ та з сертифікатом ЄС.
Більш детальна інформація подається нижче.

PT Declaração de Conformidade

A Grundfos declara sob sua única responsabilidade que os produtos AMD, AMG e AFG, aos quais diz respeito esta declaração, estão em conformidade com as seguintes Directivas do Conselho sobre a aproximação das legislações dos Estados Membros da CE:

- Directiva Máquinas (2006/42/CE).
Norma utilizada: EN ISO 12100: 2003.
- Directiva Baixa Tensão (2006/95/CE).
Normas utilizadas: EN 60034 e EN 60204: 2006.
- Directiva EMC (compatibilidade electromagnética) (2004/108/CE).
Normas utilizadas: EN 61000-6-2: 2005 e EN 61000-6-3: 2007.
- Directiva ATEX (94/9/CE) (AMD, AMG, AFG, relé ALR-20/A Ex).
Aplica-se apenas a produtos cuja utilização é em ambientes potencialmente explosivos, II 2G, equipados com uma chapa de aprovação ATEX e certificado tipo CE.
Para mais informações consulte abaixo.

Product	Certificate No	Standards used
AMD, AMG, AFG	SEV 05 ATEX 0109 X SEV 05 ATEX 0111 X	EN 1127-1: 2007, EN 60079-0: 2009, EN 60079-1: 2007, EN 60079-7: 2007, EN 60079-11: 2007, EN 13463-1: 2009, EN 13463-5: 2003 and EN 13463-8: 2003.
ALR-20/A Ex	SEV 05 ATEX 0131	EN 1127-1: 2007, EN 60079-0: 2006 and EN 60079-11: 2007.

Notified body: Electrosuisse. No. 1258. Luppmenstrasse 1, CH-8320 Fehraltorf, Switzerland.
Manufacturer: GRUNDFOS Arnold AG, Industrie Nord 12, CH-6105 Schachen, Switzerland.

RU Декларация о соответствии

Мы, компания Grundfos, со всей ответственностью заявляем, что изделия AMD, AMG и AFG, к которым относится настоящая декларация, соответствуют следующим Директивам Совета Евросоюза об унификации законодательных предписаний стран-членов ЕС:

- Механические устройства (2006/42/EC).
- Применявшийся стандарт: EN ISO 12100: 2003.
- Низковольтное оборудование (2006/95/EC).
- Применявшиеся стандарты: EN 60034 и EN 60204: 2006.
- Электромагнитная совместимость (2004/108/EC).
- Применявшиеся стандарты: EN 61000-6-2: 2005 и EN 61000-6-3: 2007.
- Директива ATEX (94/9/EC) (AMD, AMG, AFG, реле ALR-20/A Ex).
- Действительно только для изделий, разрешённых для использования в потенциально взрывоопасных условиях, II 2G, с маркировкой ATEX на фирменной табличке и Сертификатом (свидетельством) типовой проверки ЕС.

Подробная информация представлена ниже.

SK Prehlásenie o konformite

My firma Grundfos prehlasujeme na svoju plnú zodpovednosť, že výrobky AMD, AMG a AFG, na ktoré sa toto prehlásenie vzťahuje, sú v súlade s ustanovením smernice Rady pre zblíženie právnych predpisov členských štátov Európskeho spoločenstva v oblastiach:

- Smernica pre strojové zariadenie (2006/42/EC).
- Použitá norma: EN ISO 12100: 2003.
- Smernica pre nízkonapäťové aplikácie (2006/95/EC).
- Použité normy: EN 60034 a EN 60204: 2006.
- Smernica pre elektromagnetickú kompatibilitu (2004/108/EC).
- Použité normy: EN 61000-6-2: 2005 a EN 61000-6-3: 2007.
- Smernica pre ATEX (94/9/EC)

(AMD, AMG, AFG, relé ALR-20/A Ex).

- Platí iba pre výrobky určené pre použitie v potenciálne výbušnom prostredí, II 2G, vybavené samostatným typovým štítkom s označením ATEX a certifikátom o skúške typu EC.

Ďalšie informácie sú uvedené nižšie.

RS Izjava o konformitetu

Mi, Grundfos, izjavljujemo pod vlastitom odgovornošću da je proizvod AMD, AMG i AFG, na koji se ova izjava odnosi, u skladu sa direktivama Saveta za usklađivanje zakona država članica EU:

- Direktiva za mašine (2006/42/EC).
- Korišćen standard: EN ISO 12100: 2003.
- Direktiva niskog napona (2006/95/EC).
- Korišćeni standardi: EN 60034 i EN 60204: 2006.
- EMC direktiva (2004/108/EC).
- Korišćeni standardi: EN 61000-6-2: 2005 i EN 61000-6-3: 2007.
- ATEX direktiva (94/9/EC)
- (AMD, AMG, AFG, preneseno ALR-20/A Ex).
- Primenjuje se samo na proizvode namenjene upotrebi u potencijalno eksplozivnim okolinama, II 2G, opremljene sa dodatnom ATEX pločicom i EC-tip ispitnim sertifikatom.

Više informacija potražite u tekstu dole.

RO Declarație de conformitate

Noi, Grundfos, declarăm pe propria răspundere că produsele AMD, AMG și AFG, la care se referă această declarație, sunt în conformitate cu aceste Directive de Consiliu asupra armonizării legilor Statelor Membre CE:

- Directiva Utilaje (2006/42/CE).
- Standard utilizat: EN ISO 12100: 2003.
- Directiva Tensiune Joasă (2006/95/CE).
- Standarde utilizate: EN 60034 și EN 60204: 2006.
- Directiva EMC (2004/108/CE).
- Standarde utilizate: EN 61000-6-2: 2005 și EN 61000-6-3: 2007.
- Directiva ATEX (94/9/CE) (AMD, AMG, AFG, releu ALR-20/A Ex).
- Se aplică doar produselor care se pot folosi în medii cu potențial explozibil, II 2G, și sunt continut clacuta separata de certificare ATEX si certificat de examinare de tip CE.

Mai multe informații, vezi mai jos.

SI Izjava o ustreznosti

V Grundfosu s polno odgovornostjo izjavljamo, da so naši izdelki AMD, AMG in AFG, na katere se ta izjava nanaša, v skladu z naslednjimi direktivami Sveta o približevanju zakonodaje za izenačevanje pravnih predpisov držav članic ES:

- Direktiva o strojih (2006/42/ES).
- Uporabljena norma: EN ISO 12100: 2003.
- Direktiva o nizki napetosti (2006/95/ES).
- Uporabljena norma: EN 60034 in EN 60204: 2006.
- Direktiva o elektromagnetni združljivosti (EMC) (2004/108/ES).
- Uporabljeni normi: EN 61000-6-2: 2005 in EN 61000-6-3: 2007.
- ATEX direktiva (94/9/ES) (AMD, AMG, AFG, rele ALR-20/A Ex).
- Velja samo za proizvode namenjene uporabi v potencialno eksplozivnih okoljih, II 2G, opremljene z dodatno tipsko ploščico z ATEX odobritvijo in certifikatom EG o skladnosti tipa.

Za več informacij glejte spodaj.

FI Vaatimustenmukaisuusvakuutus

Me, Grundfos, vakuutamme omalla vastuullamme, että tuotteet AMD, AMG ja AFG, joita tämä vakuutus koskee, ovat EY:n jäsenvaltioiden lainsäädännön yhdenmukaistamisen tähtäävien Euroopan neuvoston direktiivien vaatimusten mukaisia seuraavasti:

- Konedirektiivi (2006/42/EY).
- Sovellettu standardi: EN ISO 12100: 2003.
- Pienjännitedirektiivi (2006/95/EY).
- Sovellettavat standardit: EN 60034 ja EN 60204: 2006.
- EMC-direktiivi (2004/108/EY).
- Sovellettavat standardit: EN 61000-6-2: 2005 ja EN 61000-6-3: 2007.
- ATEX-direktiivi (94/9/EY) (AMD, AMG, AFG, rele ALR-20/A Ex).
- Koskee vain tuotteita, jotka on tarkoitettu käytettäväksi mahdollisesti räjähdysvaarallisissa ympäristöissä, II 2G, varustettuina erillisellä ATEX-hyväksyntäkilvellä ja EY-tyyppitarkastustodistuksella.

Katso lisätietoja jäljempänä.

Product	Certificate No	Standards used
AMD, AMG, AFG	SEV 05 ATEX 0109 X SEV 05 ATEX 0111 X	EN 1127-1: 2007, EN 60079-0: 2009, EN 60079-1: 2007, EN 60079-7: 2007, EN 60079-11: 2007, EN 13463-1: 2009, EN 13463-5: 2003 and EN 13463-8: 2003.
ALR-20/A Ex	SEV 05 ATEX 0131	EN 1127-1: 2007, EN 60079-0: 2006 and EN 60079-11: 2007.

Notified body: Electrosuisse. No. 1258. Luppmenstrasse 1, CH-8320 Fehraltorf, Switzerland.

Manufacturer: GRUNDFOS Arnold AG, Industrie Nord 12, CH-6105 Schachen, Switzerland.

SE Försäkran om överensstämmelse

Vi, Grundfos, försäkrar under ansvar att produkterna AMD, AMG och AFG, som omfattas av denna försäkran, är i överensstämmelse med rådets direktiv om inbördes närmande till EU-medlemsstaternas lagstiftning, avseende:

- Maskindirektivet (2006/42/EG).
Tillämpad standard: EN ISO 12100: 2003.
- Lågspänningsdirektivet (2006/95/EG).
Tillämpade standarder: EN 60034 och EN 60204: 2006.
- EMC-direktivet (2004/108/EG).
Tillämpade standarder: EN 61000-6-2: 2005 och EN 61000-6-3: 2007.
- ATEX-direktivet (94/9/EC) (AMD, AMG, AFG, relä ALR-20/A Ex).
Gäller endast produkter avsedda att användas i explosionsfarlig miljö, II 2G, utrustade med separat ATEX-godkännandeskylt och EG-typkontrollintyg. För ytterligare information, se nedan.

TR Uygunluk Bildirgesi

Grundfos olarak bu beyannameye konu olan AMD, AMG ve AFG ürünlerinin, AB Üyesi Ülkelerin kanunlarını birbirine yaklaştırma üzerine Konsey Direktifleriyle uyumlu olduğunun yalnızca bizim sorumluluğumuz altında olduğunu beyan ederiz:

- Makineier Yönetmeliği (2006/42/EC).
Kullanılan standart: EN ISO 12100: 2003
- Düşük Voltaj Yönetmeliği (2006/95/EC).
Kullanılan standartlar: EN 60034 ve EN 60204: 2006.
- EMC Direktifi (2004/108/EC).
Kullanılan standartlar: EN 61000-6-2: 2005 ve EN 61000-6-3: 2007.
- ATEX Yönergesi (94/9/EC) (AMD, AMG, AFG, röle ALR-20/A Ex).
Potansiyel patlayıcı ortamlarda kullanılan, Örn. II 2G, üzere parçalı olarak ATEX onay etiketi ve EC tip muayene sertifikası verilebilmektedir. Ayrıntılı bilgi için, bkz. aşağıda.

CN 产品合格声明书

我们格兰富在我们的全权责任下声明，产品 AMD, AMG 和 AFG，即该合格证所指之产品，符合欧共体使其成员国法律趋于一致的以下欧共理事会指令：

- 机械设备指令 (2006/42/EC).
所用标准：EN ISO 12100: 2003.
- 低电压指令 (2006/95/EC).
所用标准：EN 60034 和 EN 60204: 2006.
- 电磁兼容性指令 (2004/108/EC).
所用标准：EN 61000-6-2: 2005 和 EN 61000-6-3: 2007.
- ATEX (欧洲防爆) 指令 (94/9/EC) (AMD, AMG, AFG, ALR-20/A Ex).
仅适用于可在潜在爆炸性环境内使用的产品，II 2G，配有单独的 ATEX 批准牌照和 EC 类检验证书。进一步信息见以下。

Schachen, 1st November 2013



Benedikt Romer
Technical Manager
GRUNDFOS Arnold AG
Industrie Nord 12
CH-6105 Schachen
Switzerland

Person authorised to compile technical file and
empowered to sign the EC declaration of conformity.

Product	Certificate No	Standards used
AMD, AMG, AFG	SEV 05 ATEX 0109 X SEV 05 ATEX 0111 X	EN 1127-1: 2007, EN 60079-0: 2009, EN 60079-1: 2007, EN 60079-7: 2007, EN 60079-11: 2007, EN 13463-1: 2009, EN 13463-5: 2003 and EN 13463-8: 2003.
ALR-20/A Ex	SEV 05 ATEX 0131	EN 1127-1: 2007, EN 60079-0: 2006 and EN 60079-11: 2007.
Notified body: Electrosuisse. No. 1258. Luppmenstrasse 1, CH-8320 Fehraltorf, Switzerland. Manufacturer: GRUNDFOS Arnold AG, Industrie Nord 12, CH-6105 Schachen, Switzerland.		

English (GB) Installation and operating instructions

Original installation and operating instructions.

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Warning

Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.

1. Symbols used in this document



Warning

If these safety instructions are not observed, it may result in personal injury.



Warning

These instructions must be observed for explosion-proof mixers and flowmakers. It is advisable also to follow these instructions for standard mixers and flowmakers.



Caution

If these safety instructions are not observed, it may result in malfunction or damage to the equipment.



Note

Notes or instructions that make the job easier and ensure safe operation.

2. General description

This booklet includes instructions for installation, operation and maintenance of Grundfos AMD and AMG mixers and AFG flowmakers which are designed for applications involving the mixing, i.e. the homogenisation and suspension, of liquids of low to medium viscosity (≤ 500 mPas). The mixers are fitted with motors of 1.5 to 18.5 kW.

Note

There are separate installation and operating instructions for the AMD.07.18.1410 mixer. See publication no. 96526302 on www.grundfos.com.

The flowmakers are fitted with motors of 1.5 to 7.5 kW.

This booklet also includes specific instructions for explosion-proof mixers and flowmakers.

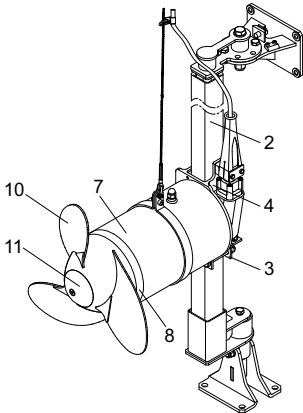


Fig. 1 AMD mixer

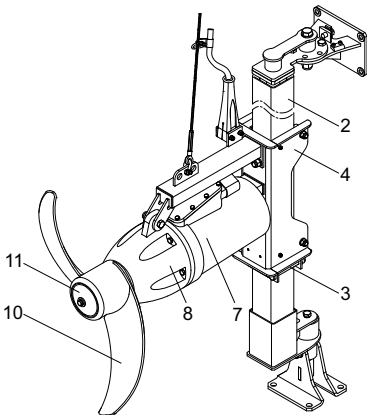


Fig. 2 AMG mixer

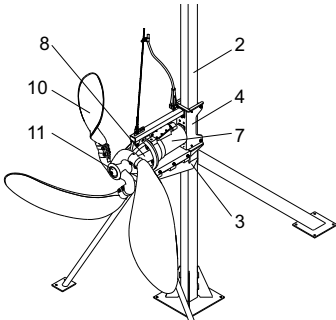


Fig. 3 AFG flowmaker

Pos.	Description
2	Column profile
3	Depth blocker
4	Motor bracket
7	Motor housing
8	AMD: Shaft seal housing AMG, AFG: Gearbox
10	Propeller
11	Hub

2.1 Applications

Grundfos mixers and flowmakers are designed for mixing applications within these areas:

- municipal and industrial wastewater treatment
- industrial processes
- sludge treatment
- agriculture.

In order not to overload the mixers and flowmakers and expose them to corrosion, the following liquid limitations must be observed.

Liquid temperature range	5 to 40 °C (*60 °C)
pH value	4 to 10
Maximum dynamic viscosity	500 mPas
Maximum density	1060 kg/m ³
Chloride content	≤ 200 mg/l (for stainless steel 1.4301)
Chloride content	≤ 1000 mg/l (for stainless steel 1.4404)

* The liquid temperature range is stated on the nameplate (see sections [3.2 Nameplate/3.3 Ex certification and classification](#)).

For the mixing of liquids exceeding the values stated above, please contact Grundfos.

2.1.1 Mixers

Mixers are suitable for applications involving sludge with a typical dry solids content as stated in the table below. Mixers are also suitable for a wide range of other applications involving similar liquids such as slurry and paper pulp.

Activated sludge	0.5 % DS
Selector zones	0.5 % DS
Anoxic zones	0.5 % DS
Bivalent zones	0.5 % DS
Anaerobic zones	0.5 % DS
Primary sludge	≤ 3 % DS
Secondary sludge	≤ 6 % DS
Digested sludge	≤ 8 % DS
Wastewater tank without screen	≤ 2 % DS
Wastewater tank with sand	≤ 2 % DS

2.1.2 Flowmakers

Flowmakers are suitable for activated sludge with a typical dry solids content of 0.5 to 1.0 % and for other liquids with a dry solids content of maximum 1.5 %.

2.2 Technical data

Voltage tolerance	- 10 %/+ 6 % of nameplate value Ex versions: ± 5 %
Enclosure class	IP68
Insulation class	F
Maximum installation depth	20 m below liquid surface
Maximum number of starts per hour	20
Power supply cable length	10 m (standard)*
Wire length on all winches	10 m (standard)*

* Standard cable lengths of 15 and 25 metres are available on request.

The mixers and flowmakers are designed for continuous operation (S1).

2.3 Potentially explosive environments

Use explosion-proof Grundfos mixers or flowmakers in potentially explosive environments.

Warning



The explosion protection classification of the mixer or flowmaker is Ex de IIC T4 or Ex e ck ib IIC T3. The classification of the installation must be approved by the local authorities in each individual case.

Type	Ex class
AMDxx.45x.xxx.Ex	Ex de IIC T4
AMG.xx.xx.xxx.Ex	Ex e ck ib IIC T3
AFG.xx.xxx.xx.Ex	

3. Identification

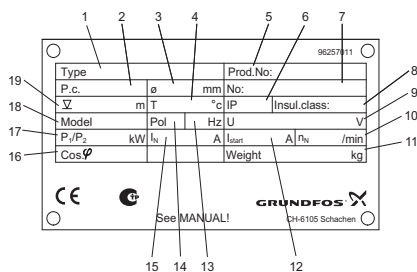
3.1 Type key

Code	Example	A	M	G.	15.	55.	342.	Ex.	5.	0B.									
Type range																			
A	AMD, AMG, AFG																		
Version																			
M	Mixer																		
F	Flowmaker																		
Drive																			
G	Gear-driven																		
D	Direct-driven																		
Motor output power P2																			
P2	Code from type designation/10 [kW]																		
15	1.5 kW																		
Propeller diameter																			
55	Code from type designation x 10 [mm] 550 mm																		
Applications																			
Blank	All applications																		
B	Biology*																		
Propeller speed																			
342	342 min ⁻¹																		
Explosion protection																			
Blank	Non-explosion-proof																		
Ex	Explosion-proof																		
Frequency																			
5	50 Hz																		
6	60 Hz																		
Supply voltage and starting method																			
0A	400 V, DOL																		
1A	400 V, Y/D																		
0B	400-415 V, DOL																		
1B	400-415 V, Y/D																		
0V	415 V, DOL																		
1V	415 V, Y/D																		
0Z	Special, DOL																		
1Z	Special, Y/D																		
Generation																			
Blank	First generation																		
A	Second generation																		
B	Third generation																		

* Only for liquids with a dry solids content ≤ 1.5 %.

3.2 Nameplate

All mixers and flowmakers can be identified by means of the nameplate on the motor housing. The details on the nameplate are required for ordering of spare parts.



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Fig. 4 Nameplate of AMD, AMG, AFG

Pos.	Description
1	Type designation
2	Production code
3	Propeller diameter
4	Liquid temperature range
5	Product number
6	Enclosure class according to IEC
7	Serial number
8	Insulation class
9	Rated voltage
10	Rated speed (propeller)
11	Weight
12	Starting current
13	Frequency
14	Number of poles
15	Rated current
16	Power factor
17	Motor power, P_1/P_2
18	Model
19	Maximum installation depth

The additional nameplate supplied with the mixer or flowmaker should be fixed in a visible position at the installation site.

3.3 Ex certification and classification

The mixers and flowmakers designed for application in potentially explosive environments (Ex versions) are supplied with a nameplate with certification details.

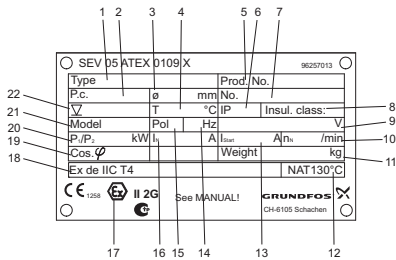


Fig. 5 Nameplate of explosion-proof, direct-driven mixers

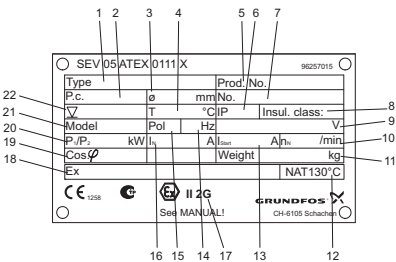


Fig. 6 Nameplate of explosion-proof, gear-driven mixers and flowmakers

Pos.	Description
1	Type designation
2	Production code
3	Propeller diameter
4	Liquid temperature range
5	Product number
6	Enclosure class according to IEC
7	Serial number
8	Insulation class
9	Rated voltage
10	Rated speed (propeller)
11	Weight
12	Nominal response temperature (NRT)
13	Starting current
14	Frequency
15	Number of poles
16	Rated current
17	ATEX category
18	ATEX approval class
19	Power factor
20	Motor power, P ₁ /P ₂
21	Model
22	Maximum installation depth

Key to certification details

Ex	Motor explosion-proof according to European standard
2G	Category 2 equipment, for gas environment
e	For increased safety according to EN 60079
d	Flameproof according to EN 60079
c	Constructional safety according to EN 13463-5
k	Liquid immersion according to EN 13463-8
ib	Intrinsically safe according to EN 60079
II	Designed for application in potentially explosive environments, except for mines
T2	Maximum surface temperature of the motor is 300 °C
T3	Maximum surface temperature of the motor is 200 °C
T4	Maximum surface temperature of the motor is 135 °C

4. Safety

4.1 General safety instructions



Warning

Before starting any work on mixers or flowmakers, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the power supply cannot be accidentally switched on.

Warning

These safety instructions as well as the instructions in each individual section must be followed when transporting, storing, handling and operating the mixer or flowmaker.



The mixer or flowmaker must be installed, connected, started up and serviced by qualified persons.

Beware of rotating parts.

Make sure that persons cannot accidentally fall into the tank, e.g. by installing a cover or railing.

4.2 Explosion-proof versions



Warning

When using explosion-proof mixers and flowmakers, observe the following safety regulations.

Equipotential bonding

All explosion-proof mixers and flowmakers have an external equipotential bonding terminal on the back of the motor, and a copper wire with a minimum cross section of 4 mm² can be connected to this terminal.

The power cable must be fixed in such a way that it cannot be caught in the propeller during operation.

Leakage sensor

Together with the Grundfos relay, type ALR-20/A-Ex, the leakage sensor forms the basis of the Ex approval. The relay must therefore always be installed together with explosion-proof mixers and flowmakers. The relay must be ordered separately.

Part number: 96489569.

As the leakage sensor is intrinsically safe, it must be connected via the blue leads.

Temperature monitoring

The motor temperature must always be monitored via the built-in PTC sensors. The associated relay must be certified for this use.

Power supply cable

The factory-fitted power supply cable must not be shortened.



Warning

Mixers and flowmakers must not be dismantled in an explosive atmosphere.

Soft starter and frequency converter

Soft starters and frequency converters may only be used if the Ex classification of these is higher than for the mixer or flowmaker, and if they are installed in accordance with the Ex regulations.

Accessories

Only use the mixer or flowmaker together with accessories supplied and approved by Grundfos.

Flowmakers

Due to the risk of electrostatic charging, flowmakers with polymer propeller must always be submerged in water, if the environment is explosive.

Maintenance, service and repair

Only Grundfos or authorised service workshops are allowed to dismantle mixers or flowmakers. This also applies to the cable entry.

Use only components produced by Grundfos for repair purposes.

Service log

Spare parts, etc. must be registered in a service log in order to have a 100 percent traceability during the product life.

5. Transportation, delivery and storage

5.1 Transportation

The individual components of the mixer or flowmaker must be packed carefully to prevent any damage to the surface protection during transportation.



Warning

Make sure that the mixer or flowmaker cannot roll or fall over.



Warning

Before attempting to lift or otherwise handle the individual components of the mixer or flowmaker, observe any local regulations that set limits for the weight of the components to be lifted manually by individuals, i.e. handled without the use of lifting equipment.

All lifting equipment must be rated for the purpose and checked for damage before any attempts to lift the components are made. The lifting equipment rating must under no circumstances be exceeded.

5.2 Delivery



Warning

Do not install a damaged mixer or flowmaker.

On delivery, the mixer or flowmaker and any accessories supplied with it should be checked for transport damage. This also applies when the equipment is delivered to the installation site.

If the mixer, flowmaker or any accessories have been damaged, contact and inform your local Grundfos company before continuing to install the equipment. Do not dismantle a damaged new component for further inspection, unless instructed by your local Grundfos company.

Dispose of packaging material according to local regulations.

5.3 Storage

Store mixers or flowmakers in a dry location in which the temperature is not subject to major fluctuations.

If the mixer or flowmaker has been stored for more than one year, the gearbox oil must be changed. The oil must be changed even if the unit has never been in use. This is necessary because of natural aging of mineral oil lubricants.

6. Installation

During installation, the mixer or flowmaker must only be lifted using the suspension point.

Do not use the lifting equipment supplied with the unit nor the wire used for lifting and lowering the mixer or flowmaker into the tank as universal lifting equipment.

Caution

Never hang the mixer or flowmaker by the power supply cable. Never let the mixer or flowmaker run while hanging in the lifting equipment.

See pages 33 and 34 for details about weights.

6.1 Positioning

Correct positioning of mixers and flowmakers is essential to ensure trouble-free operation and long life.

Observe the guidelines in the following sections.

6.1.1 Mixers

Submerge the mixer as deeply as possible.

- Place the mixer in such a way that a good mixing of the liquid in the entire tank is obtained. If more mixers are installed in the same tank, the mixers must not generate opposite flows.
- The distance between the propeller tip and the bottom of the tank, H_{MIN} in fig. 7, should be half of the propeller diameter.
- The distance from the propeller tip to the liquid surface, H_{ABOVE} in fig. 7, should be at least equal to the propeller diameter.
- The distance between the propeller tip and the wall behind the mixer, L_{MIN} in fig. 7, should be at least 1.5 times the propeller diameter.

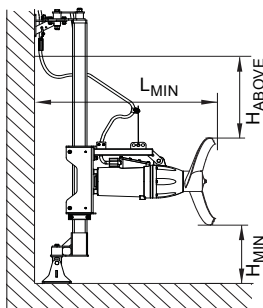


Fig. 7 Positioning sketch for mixers

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6.1.2 Flowmakers

Submerge the flowmaker as deeply as possible.

- The distance between the propeller tip and the bottom of the tank, H_{MIN} in fig. 8, should be 50 cm.
- The distance from the propeller tip to the liquid surface, H_{ABOVE} in fig. 8, should be at least 0.75 times the propeller diameter.
- The distance between the propeller tip and the wall behind the flowmaker, L_{MIN} in fig. 8, should be at least twice the propeller diameter.
- The sideways distance between the propeller tip and the tank wall must be at least 0.5 metres.
- If more flowmakers are installed in parallel, the distance between their propellers must be larger than half the propeller diameter.
- The distance from a bend in the channel to the propeller and from the propeller to aeration areas should be at least the larger value of channel width and water level.

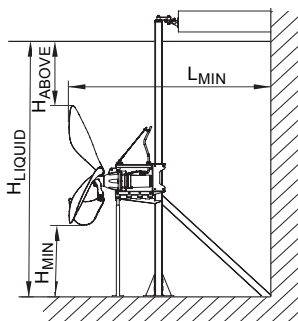


Fig. 8 Positioning sketch for flowmakers

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6.2 Installation

6.2.1 Torques

All nuts and screws used for the installation must be made of stainless steel.

Use grease (Alu-paste) together with a spring washer or lock nut; otherwise, use Loctite or a similar product for lubrication and locking.

All stainless-steel nuts and screws should be tightened to the following torques:

	Screws F-class 70 [Nm]	Screws F-class 80 [Nm]
M6	8.8	11.8
M8	21.4	28.7
M10	44	58
M12	74	100
M16	183	245
M20	370	494

When mounting the hub/propeller, use lock washer (pos. 1107), and tighten the two shaft nuts (pos. 1106) to a torque of 50 Nm. See fig. 9.

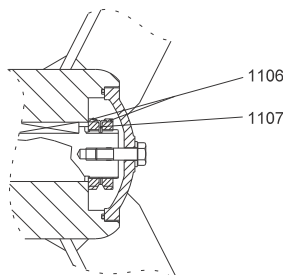


Fig. 9 Shaft nuts on propeller shaft

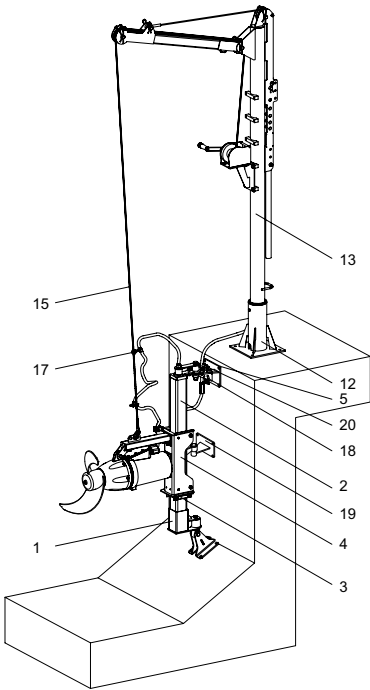
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6.2.2 Anchor bolts

Anchor bolts used for mounting components in concrete must have the following pull-out strength:

Size	Pull-out strength
M12	6 kN
M16	14 kN

6.2.3 Mixers



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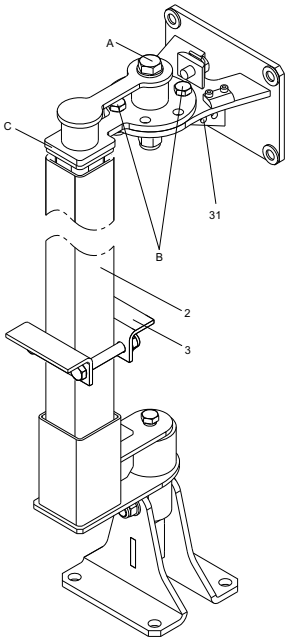
Fig. 10 Installation of AMD and AMG mixers
Position numbers in figures 10 and 11

Pos.	Description
1	Bottom fixation bracket
2	Column profile
3	Depth blocker
4	Motor bracket
5	Top fixation bracket incl. safety wire
12	Crane foot
13	Crane with winch
15	Lifting wire incl. shackle and wire clamp
17	Cable clamp
18	Cable sock incl. shackle
19	Intermediate fixation bracket
20	Wire clamp
31	Hole for fastening of safety wire

Procedure

Torques appear from section 6.2.1 *Torques*.

1. Drill the holes for the mounting screws for the top fixation bracket in the concrete.
2. Mount the screws, and fit the top fixation bracket.
3. Place the bottom fixation bracket in the right position (vertically below the top fixation). The bottom fixation bracket can be mounted in any angle from vertical to horizontal position.
4. Drill the holes for the mounting screws for the bottom fixation bracket.
5. Mount the screws, and fit the bottom fixation bracket.
6. Depending on the length of the column profile, weld the turnable part of an intermediate fixation bracket (pos. 19) to the column profile.
7. Position and align the column profile in the bottom fixation bracket. Shorten the column profile (pos. 2) to the correct length to match the position of the insulator (pos. C) at the top fixation bracket. A gap of 5 to 10 mm between collar of insulator and column profile is optimal. See fig. 11.



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Fig. 11 Fixation

8. Remove the insulator and the turnable metal part by removing the centre screw (pos. A) and the two fixation screws (pos. B).

9. Adapt the outside of the square insulator to the inside of the column profile. The insulator must fit tightly inside the column profile.
10. Insert the column profile into the bottom fixation bracket, and mount the top end with the insulator and the turnable metal part on the already installed top fixation bracket. Tighten the three screws (pos. A and pos. B) in the desired position. It is possible to adjust the angle in steps of 7.5° .
11. If an intermediate fixation bracket (pos. 19) is used, fit it to the turnable part welded on to the column profile in step 6. Drill holes in the tank wall, fit screws in the bracket and tighten the screws.

Caution

Make sure that the mixer cannot be turned so much that the propeller touches the tank wall.

12. Fasten the depth blocker (pos. 3) in the right position.
13. Drill the holes for the mounting screws for the crane foot (pos. 12) in the concrete.
14. Mount the crane foot, and fit and tighten the screws.
15. Mount the lifting wire (pos. 15) on the motor bracket using the shackle. See fig. 10.
16. Mount the top end of the safety wire to the hole (pos. 31) of the top fixation bracket using a shackle. The other end of the safety wire ends in a shackle through which the lifting wire must run.

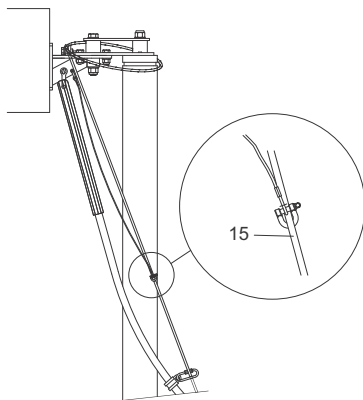


Fig. 12 Safety wire

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17. Fix the power supply cable to the lifting wire by means of a cable clamp approx. 0.8 m above the mixer. This will prevent the cable from falling down and becoming entangled in the propeller during operation. Connect the cable clamp to the lifting wire above the wire clamp by means of a snap hook. See fig. 13. Attach the power supply cable to the lifting wire by means of cable clamps placed at 1 m intervals.

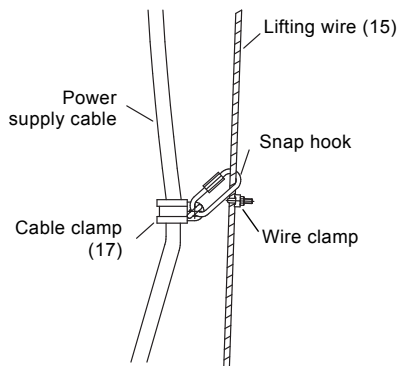


Fig. 13 Attaching the power supply cable to the lifting wire

18. Position the crane in the foot, and mount the lifting wire in the drum of the winch.

Caution

At least three turns of wire must always remain on the drum. Otherwise the wire may break loose from the drum fixation.

Note

Consider and follow the separate installation and operating instructions for cranes.

19. Lift the complete mixer (motor bracket with motor) using the crane and slide it over the column profile.
20. Slowly lower the mixer into the tank and down to its position on the depth blocker.

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21. Mount the cable sock (pos. 18) to the top fixation bracket using the shackle, and pull the motor cable through it to the desired position. See fig. 14. The power supply cable should be slightly tightened.

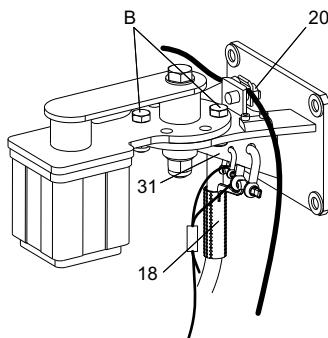


Fig. 14 Top fixation bracket with lifting and safety wires and cable sock

Caution

Dismantle the lifting wire from the crane before starting the mixer.

22. Dismantle the lifting wire from the winch and fit it to the wire clamp (pos. 20) on the top fixation bracket. Use the lifting wire as a relief for the power supply cable. For this reason, the lifting wire must always be tightened.
23. Check the distance between the propeller and the wall and the propeller and the bottom of the tank when the motor bracket is resting on the depth blocker. The mixer must under no circumstances touch other installations, bottom or wall. This also applies when the mixer is turned.



Warning

Make sure that the power supply to the control cabinet has been switched off.

24. Connect the power supply cable to the terminals in the control cabinet.

6.2.4 Flowmakers

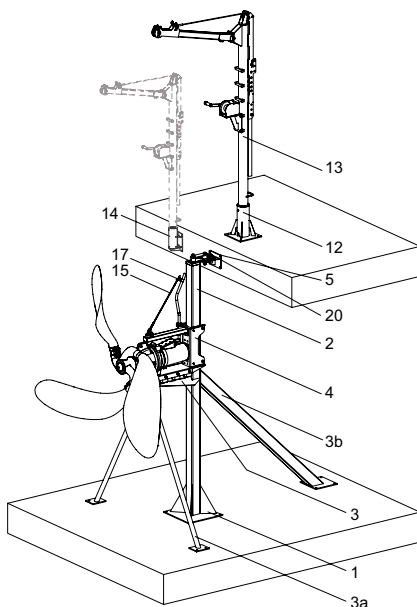


Fig. 15 Installation of AFG flowmaker

Position numbers in figures 15 and 21

Pos.	Description
1	Bottom fixation plate
2	Column profile
3	Depth blocker
3a	Front support leg
3b	Back support leg
4	Motor bracket
5	Top fixation bracket incl. safety wire
12	Crane foot
13	Crane with winch
14	Crane foot for vertical installation
15	Lifting wire incl. shackle and wire clamp
17	Cable clamp
20	Wire clamp
31	Hole for fastening of safety wire

Procedure

Torques appear from section 6.2.1 *Torques*.

Note

The propeller blades can be mounted before installation of AFG.xx.180/230/260 or after the crane has been installed.

6.2.5 Mounting the propeller blades of AFG.xx.180/230

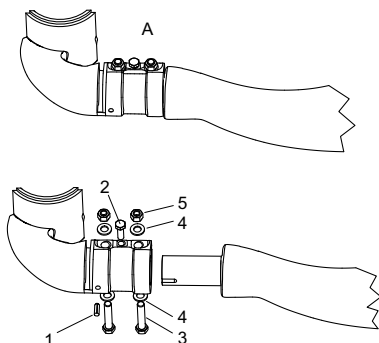


Fig. 16 AFG.xx.180/230

The fixation of the propeller blades is ensured by the pressure of the clamping jaws formed by the screws (pos. 3) and nuts (pos. 5). The function of the pin (pos. 1) is to position the blades in the right angle before tightening the clamping jaws.

Caution

1. Check the premounted pins (pos. 1) (only for positioning).
2. Tighten screw (pos. 2) to widen the opening in the hub.
3. Insert the blade from above. Turn it slightly and let it rest on the pin. Turn back until the blade slides down and is flush with the hub.
4. Remove screw (pos. 2).
5. Put Loctite 243 threadlocker on thread of screw (pos. 3).
6. Mount pos. 3, 4 and 5 in both holes and tighten by hand.
7. Tighten both nuts (pos. 5) with a torque wrench to 100 Nm (A4-80).
8. Carry out a visual check. See pos. A in fig. 16.
9. Refit screw (pos. 2) and tighten only slightly.
10. Apply silicone to the joint between blade and hub.

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6.2.6 Mounting the propeller blades of AFG.xx.260

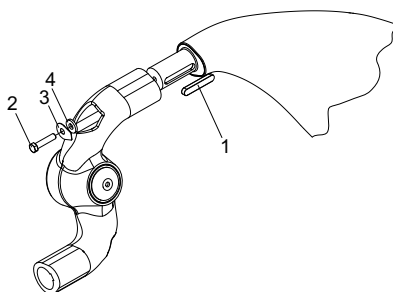


Fig. 17 AFG.xx.260

1. Drive key (pos. 1) into the keyway.
2. Apply a little oil to the blade shaft and the hole in the hub.
3. First put cover plate (pos. 3) and then washer (pos. 4) on screw (pos. 2).
4. Put Loctite 243 threadlocker on thread of screw (pos. 2).
5. Turn the hub, and insert the blade from above.
6. Turn the blade to correct position and let it slide into the hub.
7. Screw in screw (pos. 2) by hand and tighten it with a torque wrench to 183 Nm (A2-70).
8. Carry out a visual check.
9. Apply silicone to the joint between blade and hub and between cover plate (pos. 3) and hub.

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6.2.7 All AFG flowmakers

1. Weld the bottom fixation plate on the end of column profile in a workshop.

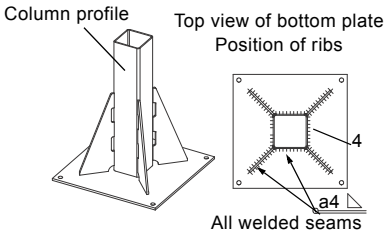


Fig. 18 Welding column profile on to bottom fixation plate

2. Place the depth blocker (pos. 2), the back support leg (pos. 3) and the front support legs (pos. 1) in the right position, and weld them on the column profile in a workshop. See position numbers in fig. 20.

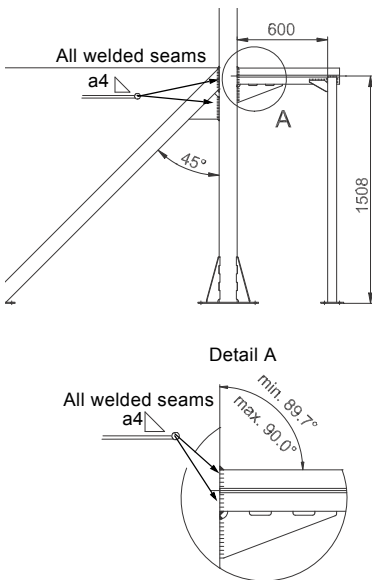


Fig. 19 Welding of column profile and support legs

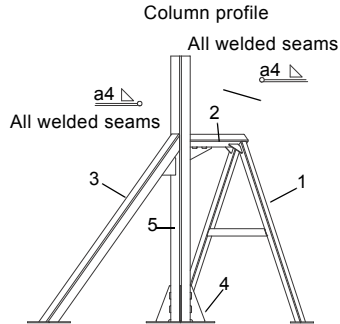
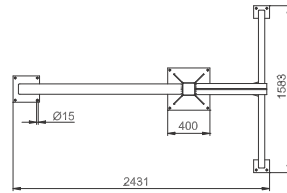


Fig. 20 Welding of column profile and support legs

3. Drill the holes for the mounting screws for the top fixation bracket in the concrete.
4. Mount the screws, and fit the top fixation bracket.

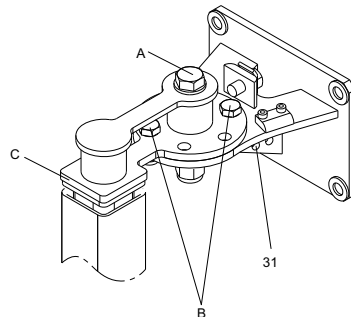


Fig. 21 Top fixation

5. Shorten the column profile (pos. 5 in fig. 19) to the correct length to match the position of insulator (pos. C) at the top fixation bracket. A gap of 5 to 10 mm between collar of insulator and column profile is optimal. See fig. 21.
6. Remove the insulator and the turnable metal part from the top fixation bracket by removing the centre screw (pos. A) and the two fixation screws (pos. B).

7. Adapt the outside of the square insulator to the inside of the column profile. The insulator must fit tightly inside the column profile.
8. Fit the turnable metal part (now fitted on top of the column profile) to the already mounted top fixation bracket. Tighten the three screws (pos. A and B) in the desired position. It is possible to adjust the angle in steps of 7.5° .
9. Drill the holes for the mounting screws for the bottom fixation plate in the bottom of the tank, and insert the screws.
10. Tighten the screws in the bottom fixation plate.
11. Drill holes, mount and tighten screws of front and back support legs as well.
12. Drill the holes for the mounting screws for the crane foot in the concrete.
13. Mount the crane foot, and fit and tighten the screws.
14. Mount the lifting wire (pos. 15) on the motor bracket using the shackle. See fig. 22.

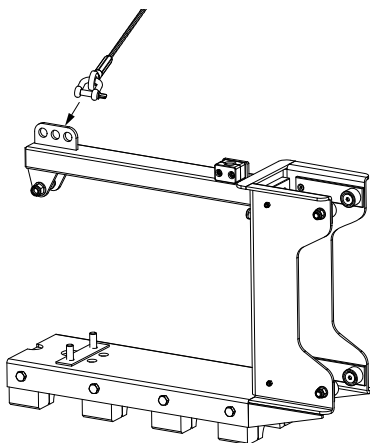


Fig. 22 Mounting of lifting wire on motor bracket

15. Mount the top end of the safety wire to the hole (pos. 31) of the top fixation bracket using a shackle. The other end of the safety wire ends in a shackle through which the lifting wire must run.

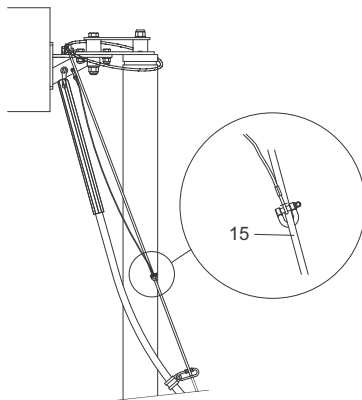


Fig. 23 Safety wire

16. Fix the power supply cable to the lifting wire by means of a cable clamp approx. 0.8 m above the flowmaker. This will prevent the cable from falling down and becoming entangled in the propeller during operation. Connect the cable clamp to the lifting wire above the wire clamp by means of a snap hook. See fig. 24. Attach the power supply cable to the lifting wire by means of cable clamps placed at 1 m intervals.

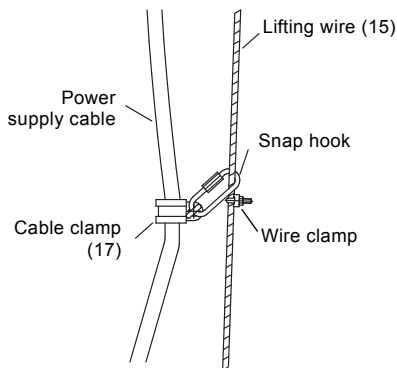


Fig. 24 Attaching the cable to the wire

17. Position the crane in the foot, and mount the lifting wire in the drum of the winch.

Caution

At least three turns of wire must always remain on the drum. Otherwise the wire may break loose from the drum fixation.

Note

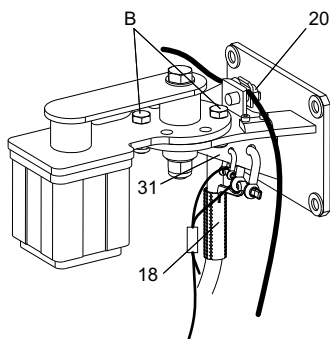
Consider and follow the separate installation and operating instructions for cranes.

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18. Lift the complete flowmaker (motor bracket with motor) using the crane and slide it over the column profile.
19. Slowly lower the flowmaker into the tank and down to position on the depth blocker.
20. Mount the cable sock (pos. 18) to the top fixation bracket using the shackle, and pull the motor cable through it, to the desired position.
See fig. 25. The power supply cable should be slightly tightened.



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Fig. 25 Top fixation bracket with lifting and safety wires and cable sock

Caution

Dismantle the lifting wire from the crane before starting the flowmaker.

21. Dismantle the lifting wire from the winch and fit it to the wire clamp (pos. 20) on the top fixation bracket.
22. Use the lifting wire as a relief for the power supply cable. For this reason, the lifting wire must always be tightened.
23. Check the distance between the propeller and the wall and the propeller and the bottom of the tank when the motor bracket is resting on the depth blocker. The flowmaker must under no circumstances touch other installations, bottom or wall.



Warning

Make sure that the power supply to the control cabinet has been switched off.

24. Connect the power supply cable to the terminals in the control cabinet.

7. Electrical connection

Electrical connections must be carried out by a qualified electrician in accordance with local regulations.

All national and local regulations relating to safety and accident prevention must be observed.

Warning



Before making any electrical connections, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the power supply cannot be accidentally switched on.

Warning



The explosion protection classification of the mixer or flowmaker is Ex de IIC T4 or Ex e ck ib IIC T3. The classification of the installation must be approved by the local authorities in each individual case.

The safety instructions in section 4.2 Explosion-proof versions must be observed.

The supply voltage and frequency are marked on the mixer or flowmaker nameplate. Make sure that the mixer or flowmaker is suitable for the power supply available at the installation site.

The mixer or flowmaker is supplied complete with a power supply cable of 10 metres (standard length, suitable for up to 7 m deep tanks). Standard cable lengths of 15 and 25 metres are available on request.

The motor is marked either with a Y (star) or a Δ (delta). Make this connection in an external control panel using conductors 1 to 6 of the power supply cable.

Figure 26 shows a schematic drawing of these star and delta connections. See also section 7.5 Wiring diagrams.

If the mixer or flowmaker is connected in delta during operation, the mixer or flowmaker can be started in star-delta starting.

Three-phase motors

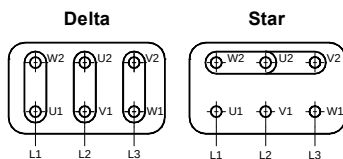


Fig. 26 Schematic drawing of delta and star connection

7.1 Motor protection

The mixers and flowmakers are provided with the following types of motor protection:

Standard mixers incorporate three bimetallic PTO thermal switches. See fig. 29.

Explosion-proof mixers and all flowmakers incorporate three PTC sensors (temperature sensors) according to DIN 44081. See fig. 30.

Function of thermal switches

The motor is protected against overheating by three thermal switches connected in series, one switch in each winding.

When the maximum winding temperature is reached, the switch will open the circuit and stop the motor.

When the windings have cooled to normal temperature, the switch will close the circuit and the motor can be restarted. Manual restarting is necessary.

See wiring diagram in fig. 29, section 7.5 Wiring diagrams.

Thermal switches (F6)

- Two conductors (terminals 11 and 12).
- Maximum operating voltage of switch: 250 V.
- Maximum switching current: 2.5 A at $\cos \varphi = 1$.
- Cutting-out temperature: 150 °C.

Function of PTC sensors

When overheated, the motor will stop. Automatic restarting is not permitted in such cases. This requires a thermistor trigger unit with a reconnection suppressor in the control circuit of the motor contactor.

See wiring diagram in fig. 30, section 7.5 Wiring diagrams.

Ø1, Ø2, Ø3: PTC sensors:

- Two conductors (terminals 31 and 32).
- Maximum voltage at the terminals:
 $U_{\max.} = 2.5 \text{ V (AC/DC)}$.
- Resistance between terminals 31 and 32:
 - at room temperature $R = 150 \text{ to } 750 \Omega$.
 - at cutting-out temperature (130 °C)
 $R \geq 4000 \Omega$.

Note When the connection at terminals 31 and 32 is tested, the test voltage must not exceed 2.5 V (AC/DC). Use an ohmmeter for the test.



Warning

Explosion-proof mixers must be protected against too high temperature by means of PTC sensors. The sensors must be connected to a certified signal converter.

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7.2 Gearbox/shaft seal housing protection

The gearbox/shaft seal housing is monitored for the ingress of water by means of a leakage sensor incorporated in the gearbox/shaft seal housing.

If the monitoring function is required, the leakage sensor must be connected to a Grundfos relay, type ALR-20/A-Ex. The ALR-20/A-Ex relay must be ordered separately. Part number: 96489569.

If the gearbox/shaft seal housing is not monitored for the ingress of water, we recommend that you make inspections every 6 months. If the oil contains water, replace the shaft seal.

Warning



Explosion-proof mixers and flowmakers must be connected to the Grundfos relay, type ALR-20/A-Ex.
Classification: II (2)G [Ex ib] IIC.
Part number: 96489569.

Note

The cable between the relay and the mixer or flowmaker must be maximum 50 m.

For longer distance, use an additional, screened cable. An external alarm indicator, if fitted, must be connected to the potential-free outputs, terminals 1 and 3 or 4, respectively. Maximum load: 250 V, 5 A.

Warning

If the supply cable to the sensor is lengthened, comply with the ATEX directive as well as the EN 60079-0 and EN 60079-14 standards for the intrinsically safe circuit.



The terminal connections of the intrinsically safe and the not intrinsically safe circuits must be separated and must be clearly distinguishable.

The operator must make sure that all installation work is done in conformity with the relevant standards.

When the ALR-20/A-Ex relay is connected, a current of up to 10 mA will flow through the leakage sensor (terminals 21 and 22). In case water penetrates into the oil chamber, the relay will trigger an alarm signal and/or switch off the motor.

See wiring diagram in fig. 29 or 30, section 7.5 *Wiring diagrams*.

Leakage sensor

- Two conductors (terminals 21 and 22).
- Maximum operating voltage: Approx. 12 V.
- Maximum current: 1 to 10 mA.



Warning

When adjusting the relay, beware of electric voltage.

To adjust the sensitivity of the ALR-20/A-Ex relay, proceed as follows:

1. Turn the adjusting screw on the relay **a** until the indicator light **b** lights up.
2. Turn the adjusting screw in the opposite direction until the indicator light goes out.
3. Continue to turn the adjusting screw 60 ° (same direction as under point 2).

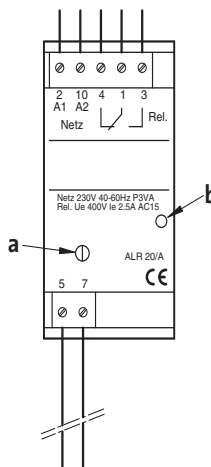


Fig. 27 Adjusting the relay



Fig. 28 ALR 20 relay connections

Note

Do not check the leakage sensor with an ohmmeter or other measuring instruments. The leakage sensor is an electronic component.

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7.3 Overload relays

The motor must be protected against overload via a thermal delay relay according to local regulations. The relay must be adjusted to the rated current stated on the nameplate.

In the case of star-delta starting, the adjustable value is to be $I_N \times 0.58$.

Incorporate electro-thermal all-pole triggers in all six mains conductors (U₁, V₁, W₁ and U₂, V₂, W₂).

7.4 Starting method

7.4.1 Mixers

Continuous operation

Motors up to 2.2 kW can be started via direct starting.

We recommend star-delta starting, soft starter or frequency converter for motors of 3.0 kW and up.

Intermittent operation

We recommend star-delta starting, soft starter or frequency converter throughout the entire power range.

7.4.2 Flowmakers

Flowmakers must be started via a star-delta starting, soft starter or frequency converter.

7.5 Wiring diagrams

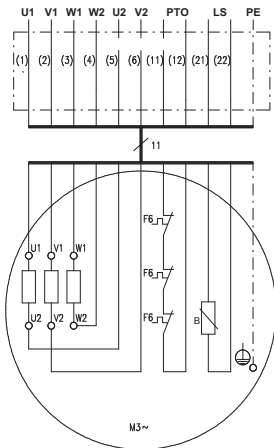


Fig. 29 Three thermal switches (PTO)

Terminals	Description
1, 2, 3, 4, 5, 6	Ends of the three stator windings (U ₁ , U ₂ , V ₁ , V ₂ , W ₁ , W ₂)
11, 12	Thermal switches (F6)
21, 22	Leakage sensor in gearbox (B)

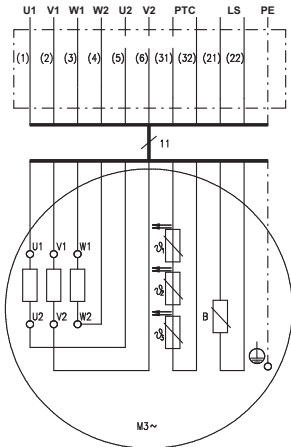


Fig. 30 Three PTC sensors

Terminals	Description
1, 2, 3, 4, 5, 6	Ends of the three stator windings (U ₁ , U ₂ , V ₁ , V ₂ , W ₁ , W ₂)
31, 32	PTC sensors according to DIN 44081 (31, 32, 33)
21, 22	Leakage sensor in gearbox (B)

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7.6 Direction of rotation

When the electrical connections have been carried out, check that the mixer or flowmaker propeller is rotating in the correct direction. When viewed from the motor, the propeller should rotate clockwise. An arrow on the motor housing shows the correct direction of rotation.

If the mixer or flowmaker propeller rotates in the wrong direction, interchange two phases of the mains supply (L1, L2, L3).

7.7 Protection against electro-chemical corrosion

Two different metals or alloys cause electro-chemical corrosion if they are connected by an electrolyte. This applies if more than one mixer or flowmaker are installed in the same tank. We recommend one of the following additional protection methods:

- galvanic separation of the earth conductor from the neutral conductor
- galvanic separation of the mains supply by means of isolation transformer.

The earth conductor must be separated in such a way as to ensure that no direct current can flow through it. It must still function as a protective conductor. This can be achieved with a limiting unit (polarisation cell or anti-parallel diode) or an isolation transformer.

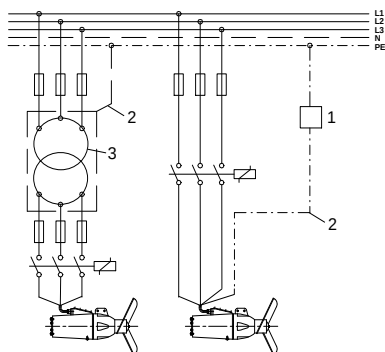


Fig. 31 Protection against electro-chemical corrosion

Pos.	Description
1	Limiting unit
2	Earth conductor
3	Isolation transformer



Warning

When using an isolation transformer, do not alter the ratio between starting current and rated current (I_A/I_N).

7.8 Frequency converter operation

AMD.15.45B.710.Ex.5.0A.A,
AMD.35.45B.705.Ex.5.1A.A,
AMD.20.45.700.Ex.5.0A.A and
AMD.30.45.710.Ex.5.1A.A mixers can be controlled by frequency converters, provided the following conditions are observed:

- The motors must be equipped with direct temperature monitoring via PTC for protection against too high motor temperature in case of operating disturbances. The PTC sensors in the windings must be connected to a suitable relay. The relay must be incorporated in the mixer controller.
- The motors can be driven via a frequency converter with the settings and rated data stated in the table below.
- The frequency converter must be set according to the rated motor data, especially the values of current, voltage, frequency and power, appearing from the motor nameplate.
- A linear relation between voltage and frequency must be selected in the duty range from 30 to 50 Hz. At frequencies below the minimum operating frequency (for instance during start-up), the voltage may deviate from the linear relation. However, the voltage must not exceed the voltage value at the minimum operating frequency. At frequencies over 50 Hz, the voltage will be steady at 400 V.
- There must be no slip compensation.

Frequency converter settings

Lower frequency of duty range $f_{\min}$	30 Hz
Rated motor frequency f_n	50 Hz
Upper frequency of duty range $f_{\max}$	50 Hz
Lower voltage limit $U_{\min}$ at $f_{\min}$	240 V
Rated motor voltage U_n at f_n	400 V
Upper voltage limit $U_{\max}$ at $f_{\max}$	400 V
Frequency converter pulse frequency (constant) f_i	4 kHz

Nominal data of frequency converter

Supply voltage	400 V, 50 Hz
Rated output power	$\geq$ rated mixer power
Maximum output current	$\geq$ rated mixer current
Maximum output voltage transients	1000 V

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8. Startup

Check the oil level in the gearbox/shaft seal housing before starting up the mixer or flowmaker. The oil level must cover between 50 and 75 % of the gearbox/shaft seal housing.



Warning

As pressure may have built up in the oil chamber, slacken the oil screw slowly. Do not remove the screw until the pressure has been fully relieved.

If required, fill oil into the gearbox/shaft seal housing through the oil filling hole (pos. 2). See fig. 32. For oil quality and quantity, see section 9.4.1 *Oil quality, gearbox and shaft seal housing*.

It is necessary to remove the propeller of AMD to check the oil level.

If the mixer or flowmaker has been stored and not used for a period before start-up, see section 9.3 *Service chart*.

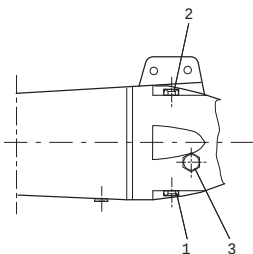


Fig. 32 Oil check and oil filling

Checks before start-up:

1. Check that the propeller is rotating in the correct direction. See section 7.6 *Direction of rotation*.
2. Make sure that the mixer or flowmaker is completely submerged in the liquid.

Caution

The mixer or flowmaker must always be submerged during operation.

3. Make sure that there are no solid objects in the tank.



Warning

Make sure that no persons can fall into the tank.

9. Service

Warning

Before starting any work on mixers or flowmakers, make sure that the fuses have been removed or the mains switch has been switched off. Make sure that the power supply cannot be accidentally switched on.

All rotating parts must have stopped moving.



Warning

All regulations applying to mixers or flowmakers installed in potentially explosive environments must be observed.

Make sure that no work is carried out in potentially explosive environment.



Before starting any work on mixers or flowmakers used in liquids which could constitute a hazard to health, carry out thorough cleaning and venting of mixer or flowmaker, tank, etc. according to local regulations.

9.1 Explosion-proof mixers and flowmakers

Explosion-proof mixers and flowmakers must be serviced and repaired by Grundfos or by a service partner appointed by Grundfos.

Spare parts

Damaged mixer or flowmaker parts should always be replaced by new, approved parts. Motor parts must not be reconditioned by machining, retapping, welding, etc.

9.2 Contaminated mixer or flowmaker

Warning

If a mixer or flowmaker has been used for a liquid which is injurious to health or toxic, the mixer or flowmaker will be classified as contaminated.



If Grundfos is requested to service the mixer or flowmaker, Grundfos must be contacted with details about the liquid, etc. *before* the mixer or flowmaker is returned for service. Otherwise Grundfos can refuse to accept the mixer or flowmaker for service.

Possible costs of returning the mixer or flowmaker are paid by the customer.

However, any application for service (no matter to whom it may be made) must include details about the liquid if the mixer or flowmaker has been used for liquids which are injurious to health or toxic.

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9.3 Service chart

	Type	Service instructions	Lubrication	Inspection
Electric motor	All	Keep the motor housing clean (otherwise cooling is affected). The motor housing must only be dismantled by Grundfos.	The roller bearings are maintenance-free. They should be replaced if they become noisy.	For motors filled with dielectric oil, oil level check and oil change are not required.
Power supply cable	All			Check the power supply cable twice a year for surface damage, strain, kinks, etc. If damaged, the cable must be replaced by Grundfos.
Shaft seal housing	AMD	In case of wear, replace lip seal and wear ring. If the oil contains water, replace the shaft seal.	Whenever the oil contains water or is contaminated, change the oil. Change the oil at least every two years.	If the shaft seal housing is not monitored for the ingress of water, we recommend that you make inspections every 6 months.
Gearbox	AMG, AFG	In case of wear, replace lip seal and wear ring. If the oil contains water, replace the shaft seal.	Change the oil whenever it contains water or is contaminated. Change the oil at least every two years. If refilling is required, see section 9.4 Oil .	If the shaft seal housing is not monitored for the ingress of water, we recommend that you make inspections every 6 months.
Propeller	All			Check the propeller blades regularly for wear and tear. Remove any material wound around the blades, such as ropes, threads, etc. which may cause uneven running and oscillation of the installation. In case of strong turbulence, cleaning is absolutely necessary.
Winch	All	Spray the winch with a protective coating of oil at regular intervals (to prevent corrosion).	Lubricate the gear teeth and the bearing bushes twice a year with an all-purpose grease.	
Lifting wire	All	Regular oiling or greasing increases the life of the wire.		Check the wire regularly and always before using the winch. Replace the wire, if required.
Screws	All	Always check that all screws in the motor bracket are properly tightened. Check the screws in the bottom fixation bracket/ bottom fixation plate every time the tank is empty.	When tightening the screws, renew the threadlocker if necessary.	

9.4 Oil

9.4.1 Oil quality, gearbox and shaft seal housing

Gear oil designation for mixers (AMD, AMG) is according to DIN 51502: ISO VG 68. Gear oil designation for flowmakers (AFG) is according to ISO VG 220.

9.4.2 Oil quality, motor

Use only special dielectric oil: Shell Fluid 4600 or Nycodiel 1244. Use of any other type of oil may damage the winding material.

The motor oil should only be changed if the motor is dismantled for service or repair.

9.4.3 Oil quantity

Non-explosion-proof mixers and flowmakers

Type	Gearbox/ shaft seal housing [l]	Motor [l]
AMD.xx.45x.xxx	0.25	-
AMG.15-22.xx		2.6
AMG.30-40.xx	1.2	1.9
AMG 55-90.xx		5.9
AMG.110-130.xx	2.5	4.1
AMG.150-185.xx	4.0	6.8
AFG.08-22.130.xx		2.6
AFG.30-40.130.xx	1.3	1.9
AFG.xx.150.xx	4.6	4.1
AFG.13-18.180.xx		2.6
AFG.24-37.180.xx	3.2	1.9
AFG.15-22.230.xx		1.6
AFG.30-40.230.xx		1.9
AFG.xx.260.xx	4.6	-

Explosion-proof mixers and flowmakers

Note

Explosion-proof mixers and flowmakers do not have any oil inside the motor.

Note

The quantity of oil in the gearbox of explosion-proof mixers and flowmakers corresponds to that of non-explosion-proof mixers and flowmakers.

9.5 Oil change

AMD

To change the oil in the shaft seal housing, proceed as follows:

1. Remove propeller.
2. Remove oil filling and oil drain screws.
3. Drain oil into a glass and leave it there for approx. 10 minutes, and check if it contains water. If the oil contains water, replace the shaft seal.

Note

Used oil must be disposed of in accordance with local regulations.

4. Fill shaft seal housing with new oil.
See section [9.4.3 Oil quantity](#).
5. Fit propeller.

AMG, AFG

To change the oil in the gearbox, proceed as follows:

1. Place mixer or flowmaker in a horizontal position on supports, and place a pan underneath to collect oil.



Warning

As pressure may have built up in the oil chamber, slacken the oil screw slowly. Do not remove the screw until the pressure has been fully relieved.

2. Slacken and remove screw (pos. 2 in fig. 33).
3. Slacken and remove oil drain screw (pos. 1), and allow the oil to drain from the chamber into a glass. Leave the oil in the glass for approx. 10 minutes, and check if it contains water. If the oil contains water, replace the shaft seal.

Note

Used oil must be disposed of in accordance with local regulations.

4. Clean and refit oil drain screw (pos. 1).
5. Fill oil into the oil chamber through filling hole (pos. 2). The quantity of oil appears from section [9.4.3 Oil quantity](#) and the quality from section [9.4.1 Oil quality, gearbox and shaft seal housing](#).
6. Refit screw (pos. 2).

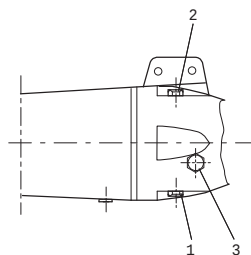


Fig. 33 Position of oil drain and oil filling screws

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10. Fault finding



Warning

Before starting any work on mixers or flowmakers, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the power supply cannot be accidentally switched on.

All rotating parts must have stopped moving.



Warning

All regulations applying to mixers or flowmakers installed in potentially explosive environments must be observed.

Make sure that no work is carried out in potentially explosive environment.

Keep a service log.

10.1 Fault finding

Fault	Cause	Remedy
1. Mixer or flowmaker does not start.	a) No power supply, or supply failure.	Call an electrician.
	b) Power supply cable is faulty.	Call an electrician.
	c) Control system is faulty.	Call an electrician.
	d) Propeller not free to rotate.	Clean the propeller blades, and check manually that the propeller can rotate freely.
	e) Stator windings are faulty.	Contact Grundfos.
	f) Motor has cut out because of overheating.	Wait until the motor has cooled, and try to restart the mixer or flowmaker.
	g) Different phase voltages.	Call an electrician.
	h) Overload relay is set too low or is faulty.	Check the overload relay. Set the relay to the rated current. See section 7.3 Overload relays .
	i) Leakage sensor has cut out mixer or flowmaker.	Contact Grundfos.
	j) Humidity in motor.	Contact Grundfos.
2. Mixer or flowmaker starts but stops immediately.	a) Stator windings are faulty.	Contact Grundfos.
	b) Different phase voltages.	Call an electrician.
	c) Overload relay is set too low or is faulty.	Check the overload relay. Set the relay to the rated current. See section 7.3 Overload relays .
	d) Leakage sensor has cut out mixer or flowmaker.	Contact Grundfos.
	e) Humidity in motor.	Contact Grundfos.
3. No or inadequate circulation produced even if the motor is running.	a) Propeller rotates in the wrong direction.	Interchange two phases of the mains supply.
	b) Mixer or flowmaker runs on two phases.	• Check electrical connections. • Replace faulty fuses. • Call an electrician.
	c) Internal parts are worn.	Contact Grundfos.
	d) Propeller blades are dirty or damaged.	Clean the blades, and inspect for any wear. In case the propeller blades are worn or damaged, contact Grundfos.

Fault	Cause	Remedy
4. Mixer or flowmaker runs unevenly and is noisy.	a) Internal parts are worn.	Contact Grundfos.
	b) Propeller blades are dirty or damaged.	Clean the blades, and inspect for any wear. In case the propeller blades are worn or damaged, contact Grundfos.
	c) Faulty motor or gearbox roller bearings.	Contact Grundfos.
	d) Oscillations caused by the installation (resonance).	Check installation design.
5. High current and power consumption.	a) Wrong voltage supply or supply failure.	Call an electrician.
	b) Power supply cable is faulty.	Call an electrician.
	c) Control system is faulty.	Call an electrician.
	d) Propeller not free to rotate.	Clean the propeller blades, and check manually that the propeller can rotate freely.
	e) Stator windings are faulty.	Contact Grundfos.
	f) Mixer or flowmaker runs on two phases.	• Check electrical connections. • Replace faulty fuses. • Call an electrician.
	g) Internal parts are worn.	Contact Grundfos.
	h) Faulty motor or gearbox roller bearings.	Contact Grundfos.

11. Technical data

11.1 Motor

AMD, AMG, AFG	
Protective system	IP68 to 20 m
Insulation class	F
Sealing	Radial shaft seal ring/mechanical shaft seal
Material, motor housing	Cast iron, grade 25 (EN-GJL-250)
	AMD: stainless steel (AISI 316)

11.2 Gearbox

AMG, AFG	
Type	Planetary gearbox
Gears	Hardened and ground steel
Seal monitoring	Leakage sensor incorporated in gearbox
Drive end bearings	Two tapered roller bearings
Material, gear casing	Cast iron, grade 25 (EN-GJL-250)

11.3 Shaft seals

Sealing against ingress of surrounding liquid	
AMD	V-ring, lip seal and mechanical shaft seal made of SiC/SiC
AMG, AFG	Two lip seals and one mechanical shaft seal made of tungsten carbide/tungsten carbide or SiC/SiC

11.4 Propeller

AMD	
Number of blades	3
Propeller diameter	450 mm
Propeller design	Self-cleaning, optimum-flow design
Material, propeller	Stainless steel
Material, hub	

AMG	
Number of blades	2
Propeller diameter	400-1000 mm
Material, propeller with hub	Stainless steel

AFG.xx.130	
Number of blades	2
Propeller diameter	1340 mm
Material, propeller with hub	Ductile moulded polyamide with stainless-steel hub

AFG.xx.150-260.xx	
Number of blades	2 or 3
Propeller diameter	1500, 1800, 2300, 2600 mm
Material, hub	Cast iron (EN-GJS-400-15)
Material, propeller blades	Polyurethane (Baydur) with cast-iron reinforcement

11.5 Sound pressure level

The sound pressure level of the mixer or flowmaker is lower than 70 dB(A).

12. Disposal

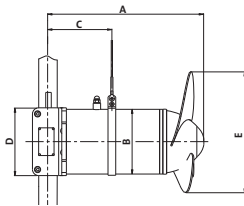
This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.

Subject to alterations.

DIMENSIONS AND WEIGHTS

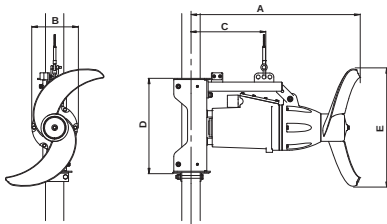
AMD



TM03 0283 4704

Type	Rated power [kW]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Weight incl. motor bracket and 10 m cable [kg]
AMD.15.45B.710.	1.5	456	210	180	220	450	59
AMD.25.45B.690.	2.5						
AMD.35.45B.705.	3.5	491		200			68
AMD.45.45B.675.	4.5						
AMD.20.45.700.	2.0	456		180			59
AMD.30.45.710.	3.0	491		200			68
AMD.40.45.695.	4.0						

AMG

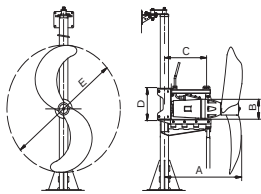


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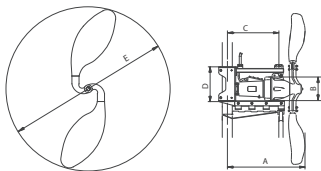
Type	Rated power [kW]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Weight incl. motor bracket and 10 m cable [kg]
AMG.15.55.339.	1.5	720	200	320	410	550	78
AMG.22.64.335.	2.2	735				635	78
AMG.30.64.336.	3.0	750				635	85
AMG.40.71.330.	4.0	760				710	85
AMG.55.73.342.	5.5	980	270	430	460	730	166
AMG.75.73.340.	7.5	990				732	168
AMG.110.84.340.	11.0	1010				840	177
AMG.150.90.357.	15.0	1160	315	460	460	900	275
AMG.185.91.356.	18.5	1180				910	280

AFG.xx.130-230.xx

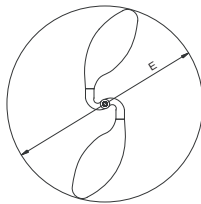
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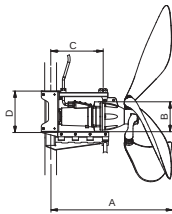
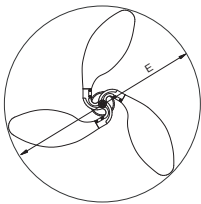
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AFG.15.230
AFG.22.230

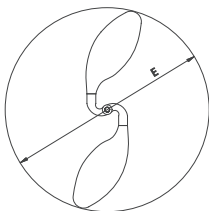
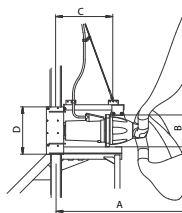
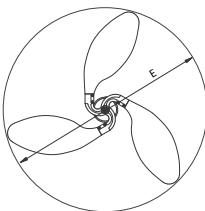


AFG.30.230
AFG.40.230



TM02 6346 0305 / TM02 6345 0305 / TM04 3959 0409 / TM04 3957 0409

Type	Propeller version	Rated power [kW]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Weight incl. motor bracket and 10 m cable [kg]
AFG.08.130.61.	2-blade	0.75	855	200	353	400	1340	102
AFG.11.130.71.		1.1						
AFG.15.130.79.		1.5						
AFG.22.130.78.		2.2						108
AFG.30.130.95.		3.0						
AFG.40.130.94.		4.0	1200	302	570	400	1800	190
AFG.13.180.30.		1.3						
AFG.18.180.34.		1.8						
AFG.24.180.39.		2.4						198
AFG.37.180.46.		3.7						
AFG.15.230.23.	3-blade	1.5	1200	302	570	400	2300	200
AFG.22.230.26.		2.2						200
AFG.30.230.30.		3.0						233
AFG.40.230.34.		4.0						233

AFG.xx.260.xx**2-blade version****3-blade version**

TM04 3957 04.09

Type	Propeller version	Rated power [kW]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Weight incl. motor bracket and 10 m cable [kg]
AFG.30.260.34.	2-blade	3.0	1500	360	650	585	2600	360
AFG.34.260.35.		3.4						
AFG.40.260.38.		4.0						
AFG.46.260.39.		4.6			680	585	2660	365
AFG.55.260.42.		5.5						
AFG.48.260.35.	3-blade	4.8	1500	360	680	585	2660	410
AFG.58.260.38.		5.8						
AFG.65.260.39.		6.5						
AFG.75.260.41.		7.5						

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